IntelliDrive Webinar

Safety Applications for Commercial Vehicles

January 20, 2010

Agenda

- Introduction – Jon Mueller, FMCSA
- Overview of IntelliDrive – Brian Cronin, ITS/JPO
- IntelliDrive for Commercial Vehicles – Jon Mueller
- V2V Research Plan – Alrik Svenson, NHTSA
- V2I Overview – Tom Kearney, FHWA
- CV IntelliDrive Project – Rick McDonough, NYSDOT
- IntelliDrive CV Working Group – Alrik Svenson
- Questions & Answers

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Overview of IntelliDrive

Brian Cronin
Team Lead
RITA ITS/JPO

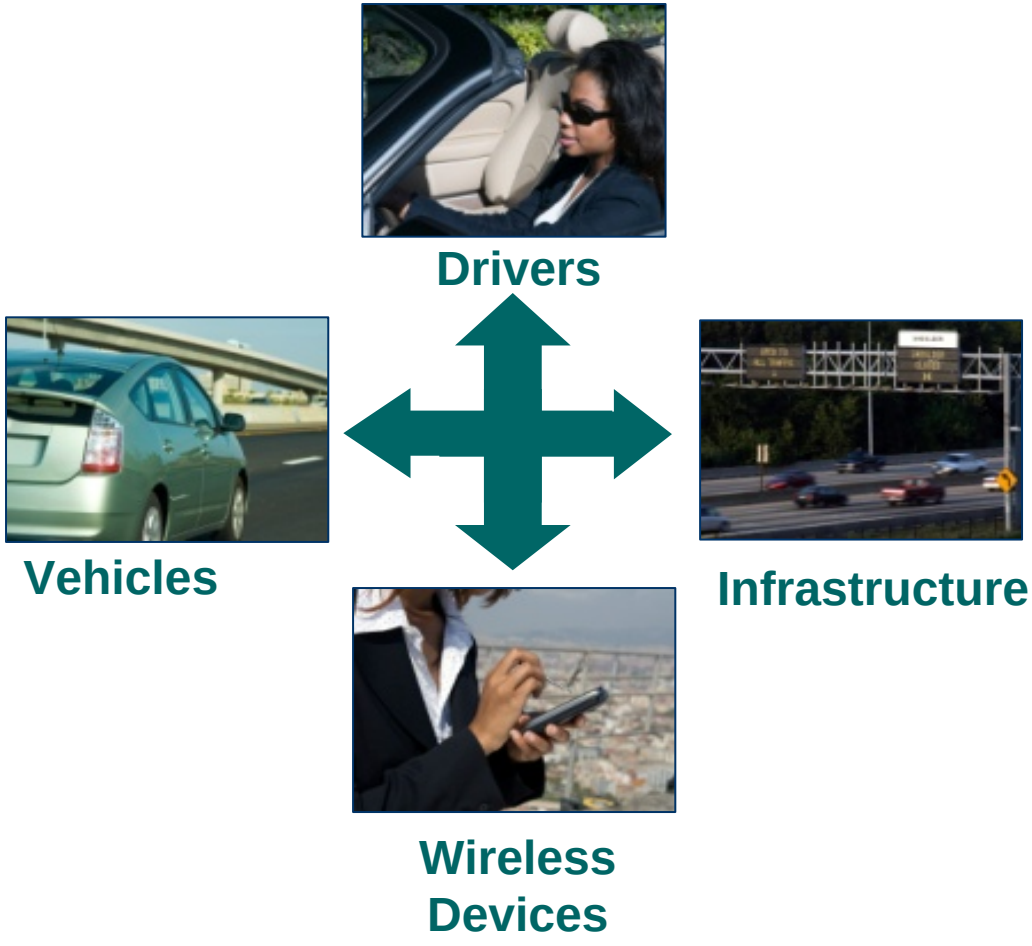
Overview of IntelliDrive

- IntelliDrive Scope
  - Safety
  - Mobility
  - Environment

Overview of IntelliDrive

- Responsibilities within the US DOT
  - Research and Innovative Technology Administration (RITA)
  - Intelligent Transportation Systems (ITS)/Joint Program Office (JPO)
  - Federal Highway Administration (FHWA)
  - Federal Motor Carrier Safety Administration (FMCSA)
  - National Highway Traffic Safety Administration (NHTSA)
  - Federal Transit Administration (FTA)

IntelliDrive℠ *is* Connectivity

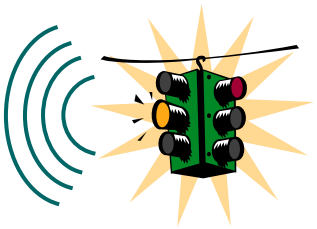


It's All About Connectivity

E-payment

"The Network"

Opportunity for Innovation



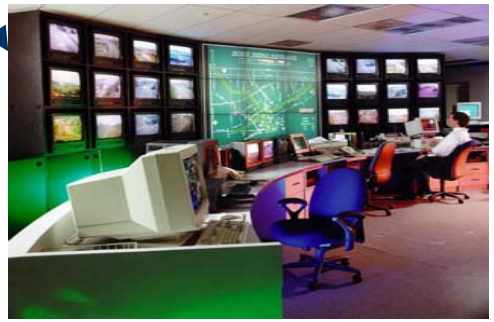
Signal Phase and Timing

- Real Time Network Data
- Situation Relevant Information

Safety Messages

Probe Data

Instrumented Roadside



Communication Methods

- DSRC = Dedicated Short Range Communication “5.9 GHz”
- DOT is committed to the use of the DSRC technologies for active safety for both vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) applications
- All wireless technologies for applicability to safety, mobility, and environmental applications will be explored
- Connectivity to include both DSRC and non-DSRC+
- Key Benefits of DSRC:
  - Low latency communication (<< 50ms)
  - High data transfer rates (3 – 27 Mbps)
  - Up to 1000m and 360°

What Can IntelliDrive℠ Do for You?

Mobility Benefits

- *V2I, I2V Interactivity* (SPAT)
- *Data-Rich Environment*
- *Operations Efficiency*
- *Traffic, Transit, Parking*
- *Weather*
- *Performance Management*

Environmental Benefits

- *Reduce Emissions*
- *Save Fuel*

Safety Benefits

- *Increase Driver Situational Awareness*
- *Reduce or Eliminate Crashes*
  - *Driver Advisories*
  - *Driver Warnings*
  - *Vehicle Safety Controls*

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IntelliDrive for Commercial Vehicles

Jon Mueller
General Engineer
FMCSA

IntelliDrive for Commercial Vehicles

- Examples of IntelliDrive Applications
  - Vehicle to Vehicle (V2V)
    - Forward Collision Warning
    - Blind spot Detection
    - Lane Change Warning
    - Do Not Pass Warning
  - Vehicle to Infrastructure (V2I)
    - Intersection Safety
    - Run-off Road Prevention
    - Smart Roadside
      - USDOT Truck Parking Programs
        - SmartPark
      - Automated Enforcement
        - Wireless Roadside Inspections

OPPORTUNITY

- A collision with a vehicle in transport was the first harmful event in **75% of all fatal crashes involving large trucks**.*
- At full coverage and full effectiveness, IntelliDrive could **save thousands of lives per year.**

*FMCSA 2007 Large Truck and Bus Crash Facts

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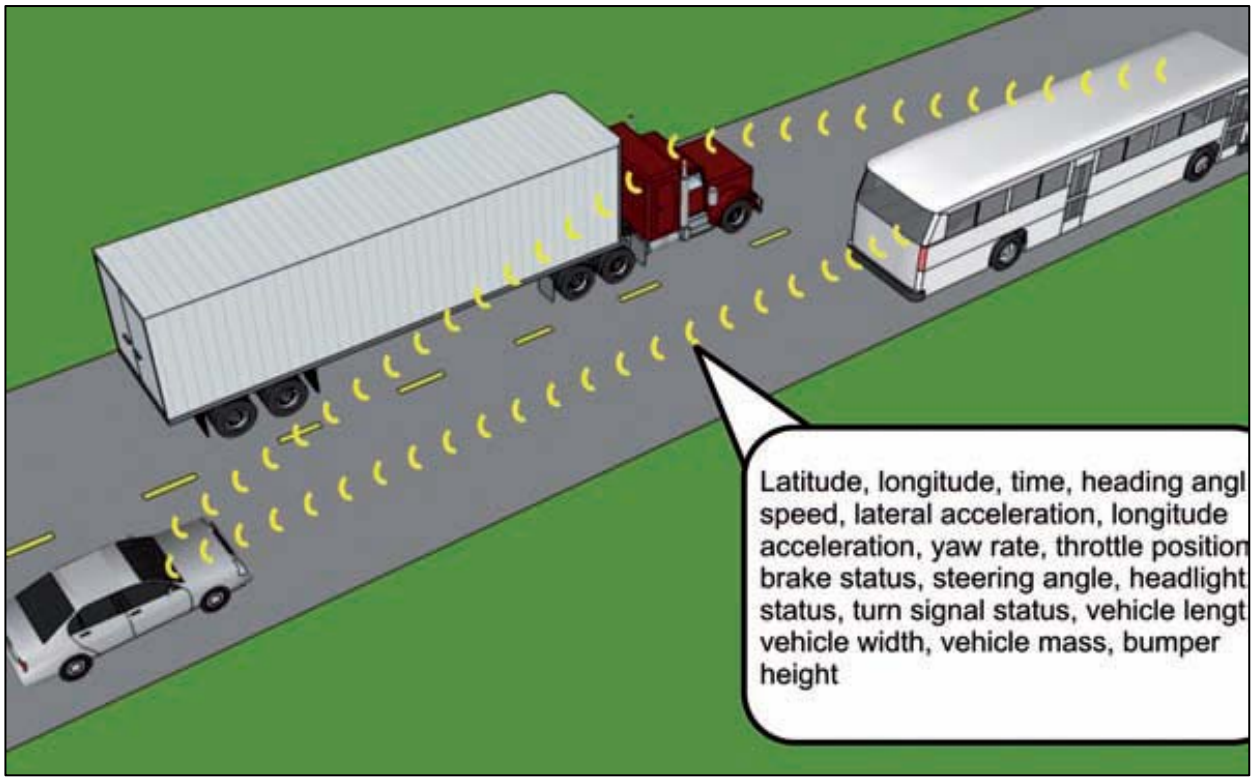
IntelliDrive Vehicle to Vehicle Safety Applications Research Plan

Alrik L. Svenson
Research Engineer
NHTSA

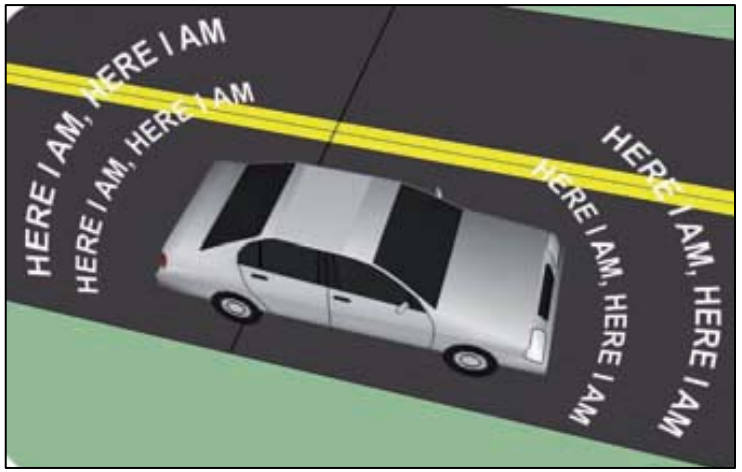
Vehicle to Vehicle Communications for Safety

- The dynamic wireless exchange of data between nearby vehicles that offers the opportunity for significant safety improvements



V2V Safety Research Plan Goals

- Employ advanced V2V wireless technologies to mitigate or prevent crashes
- Establish robust DSRC standards for safety-critical applications
- Accelerate in-vehicle technology to ensure value for the first V2V vehicles



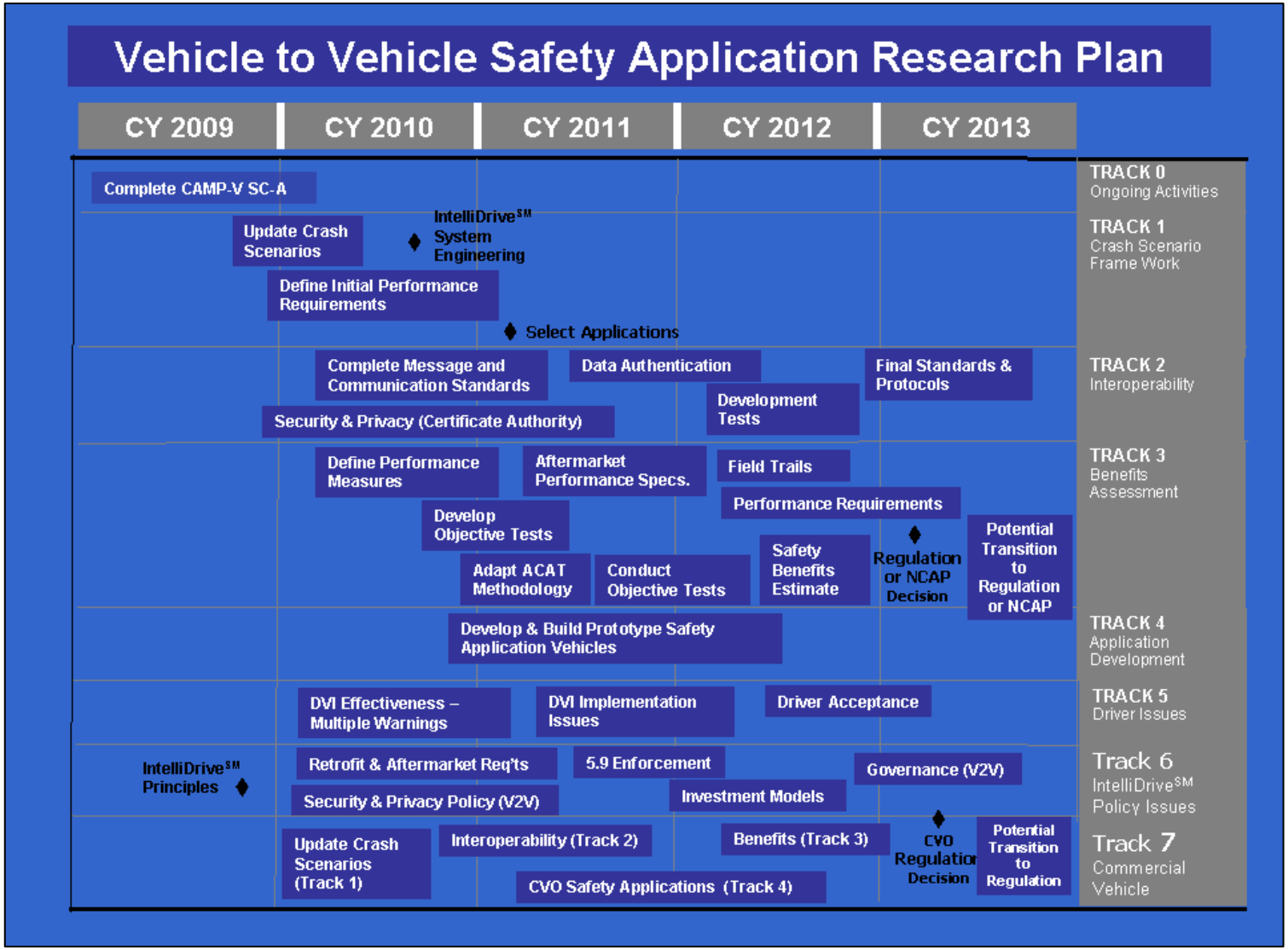
Research Outcomes

- Potential benefits of V2V technologies
- Develop practical, DSRC-based, V2V active safety applications
- Complete standards and solutions for security, scalability, positioning, and other technical issues
- Develop the driver-vehicle interface to minimize distraction and driver workload
- Develop aftermarket or retrofit solutions to accelerate V2V technology into all vehicles in the fleet
- Develop factual evidence to support NHTSA rulemaking decision in 2013

V2V Safety Application Research Tracks

- Track 1 – Crash Scenario Framework
- Track 2 – Interoperability
- Track 3 – Benefits Assessment
- Track 4 – Application Development
- Track 5 – Driver Issues
- Track 6 – IntelliDrive Policy Issues
- Track 7 – Commercial Vehicle
- Track 8 – Transit Vehicle

V2V Safety Application Research Plan



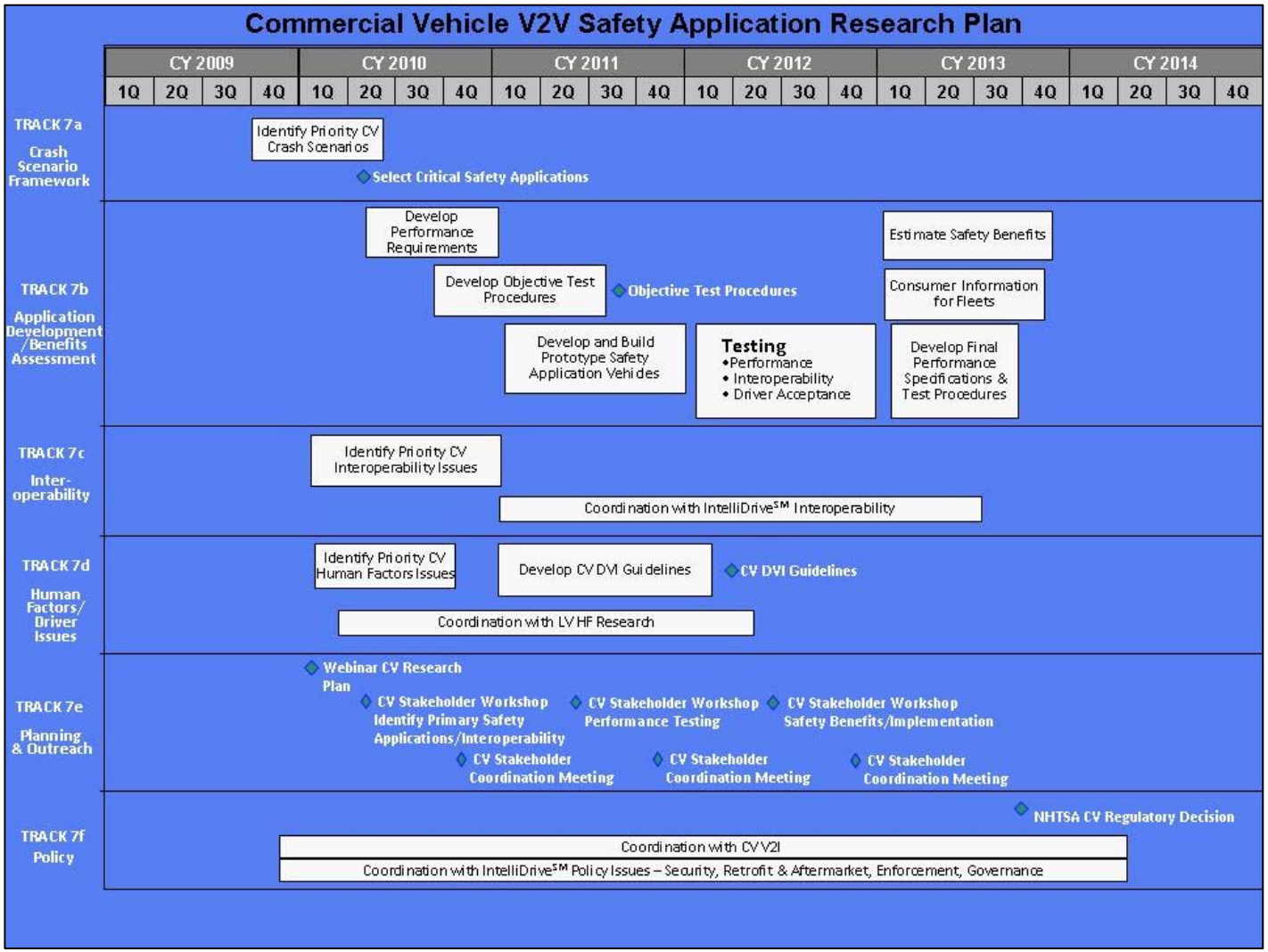
Track 7
Commercial Vehicles

- Goals
  - Develop a plan that is responsive to the needs of the commercial heavy vehicle industry stakeholders
  - Conduct research activities to resolve the technical and policy issues impeding the accelerated deployment of V2V based safety systems for commercial vehicles
- Plan is organized similarly to the overall V2V plan with tracks to outline major areas and milestones

Commercial Vehicle V2V Research Tracks

- Track 7a – Crash Scenario Framework
- Track 7b – Application Development/Benefits Assessment
- Track 7c – Interoperability
- Track 7d – Human Factors/Driver Issues
- Track 7e – Planning & Outreach
- Track 7f – Policy
  - NHTSA CV regulatory decision in 2013

CV V2V Safety Applications Research Plan



Summary

- NHTSA, in cooperation with other U.S. DOT modal administrations, has begun research on V2V communications for safety as part of the IntelliDrive Program
- V2V has the potential for significant safety benefits for all vehicles
- Both NHTSA and FMCSA are conducting research on commercial vehicle V2V to support regulatory decisions on these systems in 2013

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IntelliDrive^{SM} CVO/ Freight

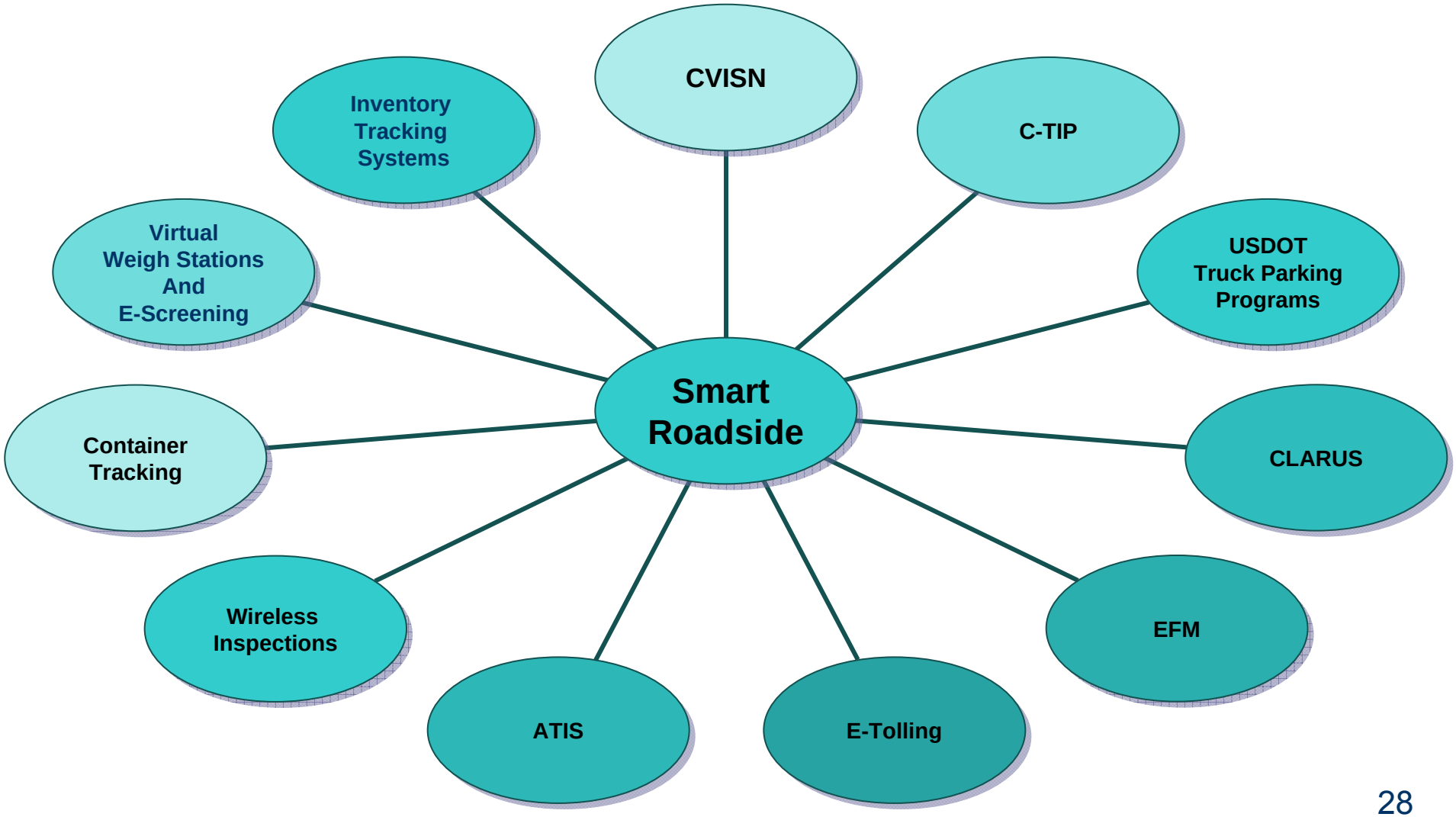
Vehicle to Infrastructure Overview

Tom Kearney
Transportation Specialist
FHWA

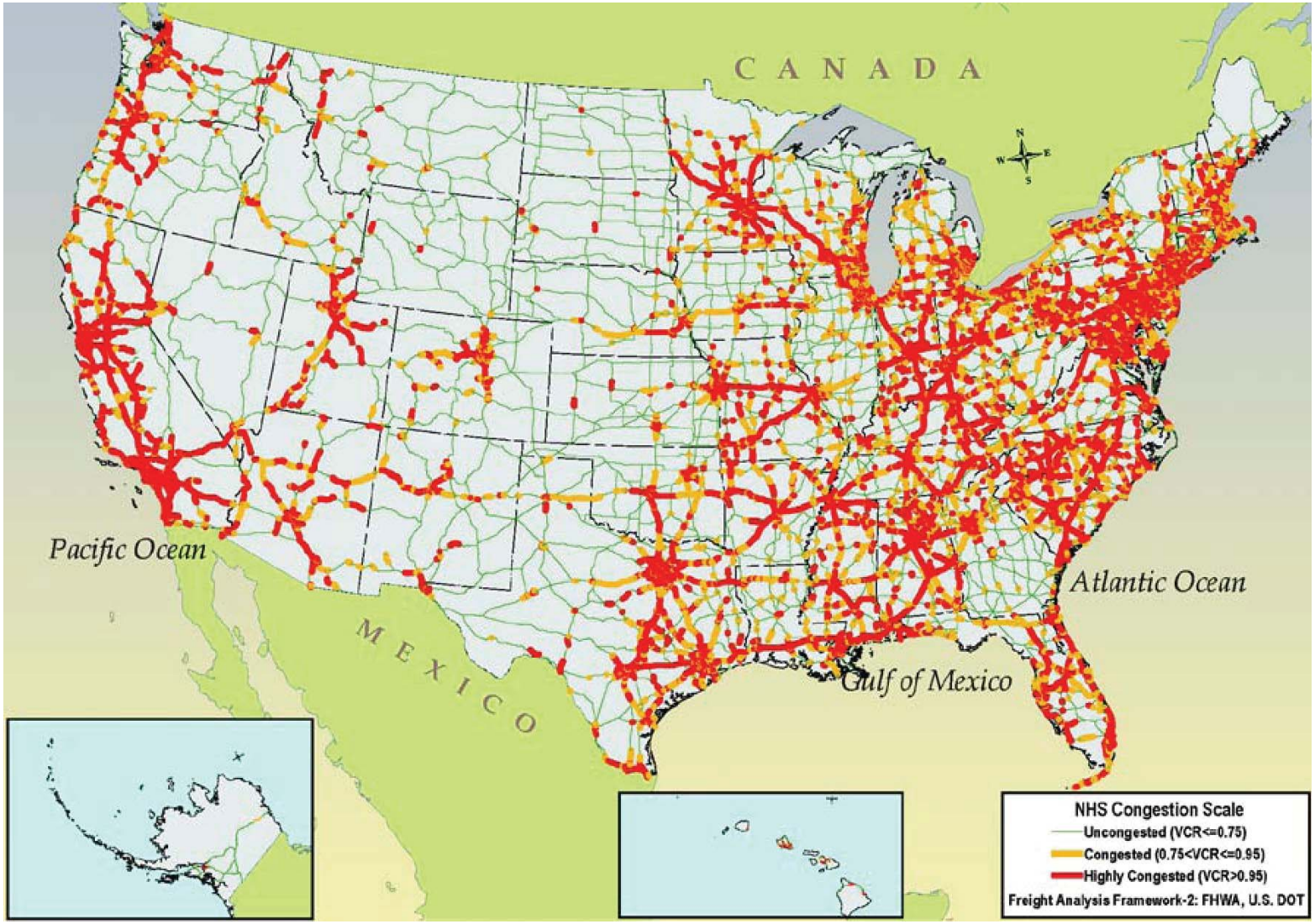
V2I – CVO/Freight

- IntelliDrive℠ CVO/Freight addresses the safety and the mobility aspects of commercial vehicle operations
- Benefits of IntelliDrive℠ CVO/Freight include “Smart Freight” component and more efficient intermodal freight linkages
- Advanced under the FHWA/FMCSA “Smart Roadside Initiative”
- Designed to support more effective and efficient enforcement activities safeguarding health of highway infrastructure and equity in the transport industry
- Includes not only automated enforcement but services to the commercial vehicle operator (Truck Parking, Road Weather and Operating Conditions Information, etc.)
- Compatibility with Private Sector Telematics
- V2I CVO/Freight Research “Roadmap” being developed

Roadside Programs/Projects Coordinated via Smart Roadside Initiative



Recurring Congestion: 2035



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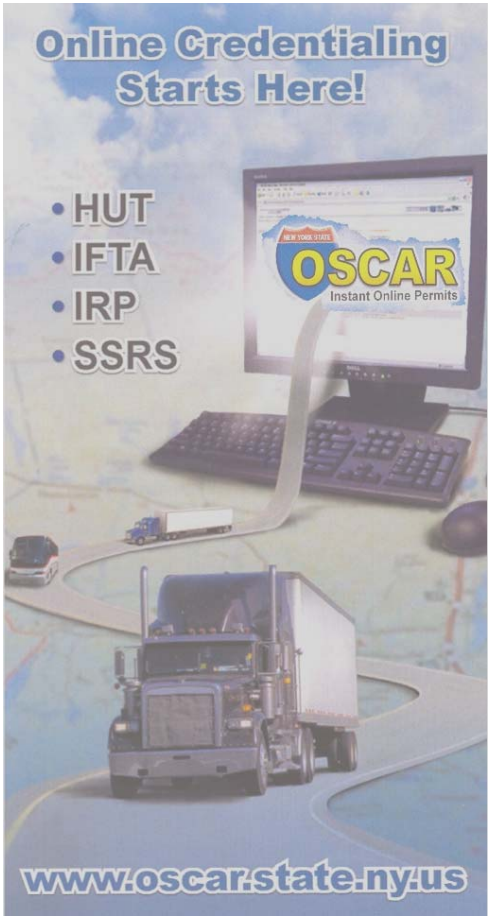
Commercial Vehicle Infrastructure Integration

a.k.a.
Commercial Vehicle IntelliDrive

Richard McDonough
Office of Modal Safety & Security
NYS Department of Transportation

Commercial Vehicle Infrastructure Integration (CVII) Program

- I-95 Corridor Coalition funded program
- Complete interoperability! Communicate with any VII compliant vehicle or infrastructure
- Integrate VII communications device w/SAE J1708 commercial vehicle data bus
- Compliant/utilize the standard message sets SAE J1587, SAE J1939 and SAE 2735
- Project started May 2009
- Two year schedule for Phase 1
- CVII Advisory Team established



CVII Program – Phase 1

- Develop/Test CV VII compliant onboard equipment (OBE) systems including Highway Vehicle Implementations (HVI) for basic communication of general info (V2I/I2V)

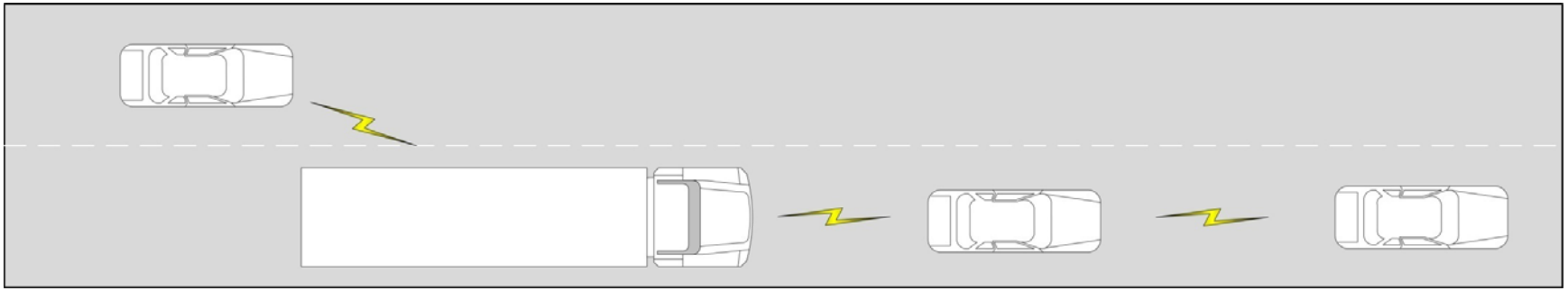
- Develop/Test CV 5.9 GHz DSRC Applications:
  - CV Driver I.D. and Verification (V2I)
  - Wireless Vehicle Safety Inspection Info (V2I)
  - CV to Maintenance Vehicle Comm. (V2V)

CVII Program – Phases 2 and 3

- Phase 2 – Pending/Scope Negotiations
  - Heavy Vehicle to Light Vehicle Driver Safety Warnings
- Phase 3 – Initiated/Funding Approved
  - 5.9GHz Interoperability with CVISN compatible (existing) 915 MHz Virtual Weigh Stations/Electronic Screening Systems

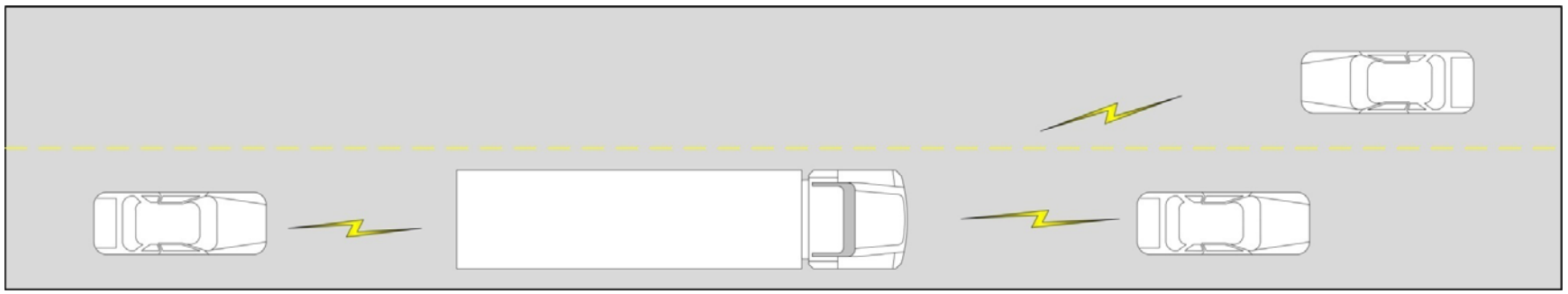
CVII Phase 2:
1. V2V Enhanced Active Safety

- Passenger Vehicles/CV exchange heartbeat messages
- Warning scenarios:
  - Potential Blind Spot Warnings
  - Hard Braking Events (multiple vehicles ahead)
  - Tailgate warning



CVII Phase 2:
2. V2V Enhanced Active Safety

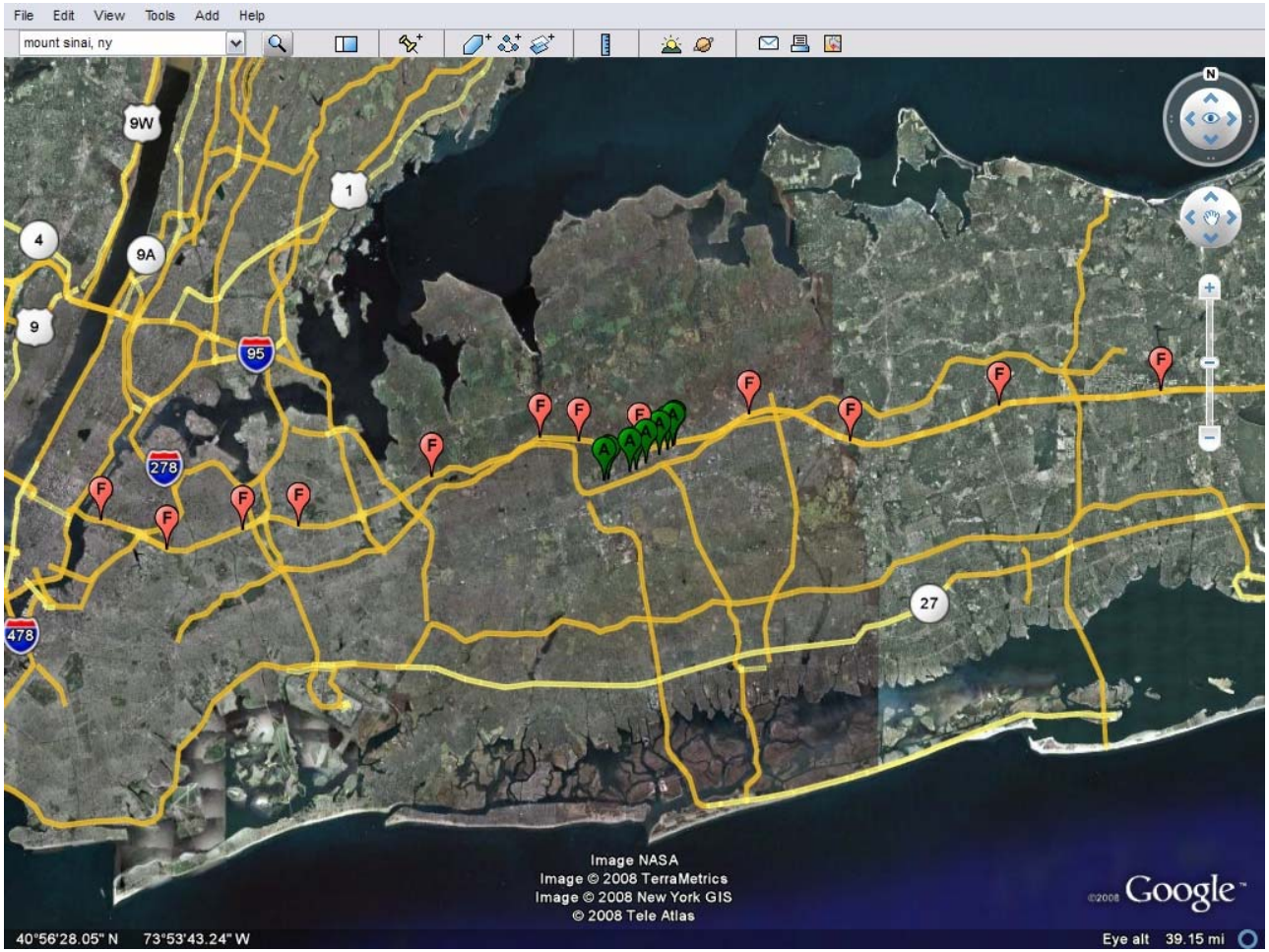
- CV analyzes heartbeats of nearby vehicles and sends an unsafe to pass message to trailing vehicle
- Ideal for rural/undivided highways



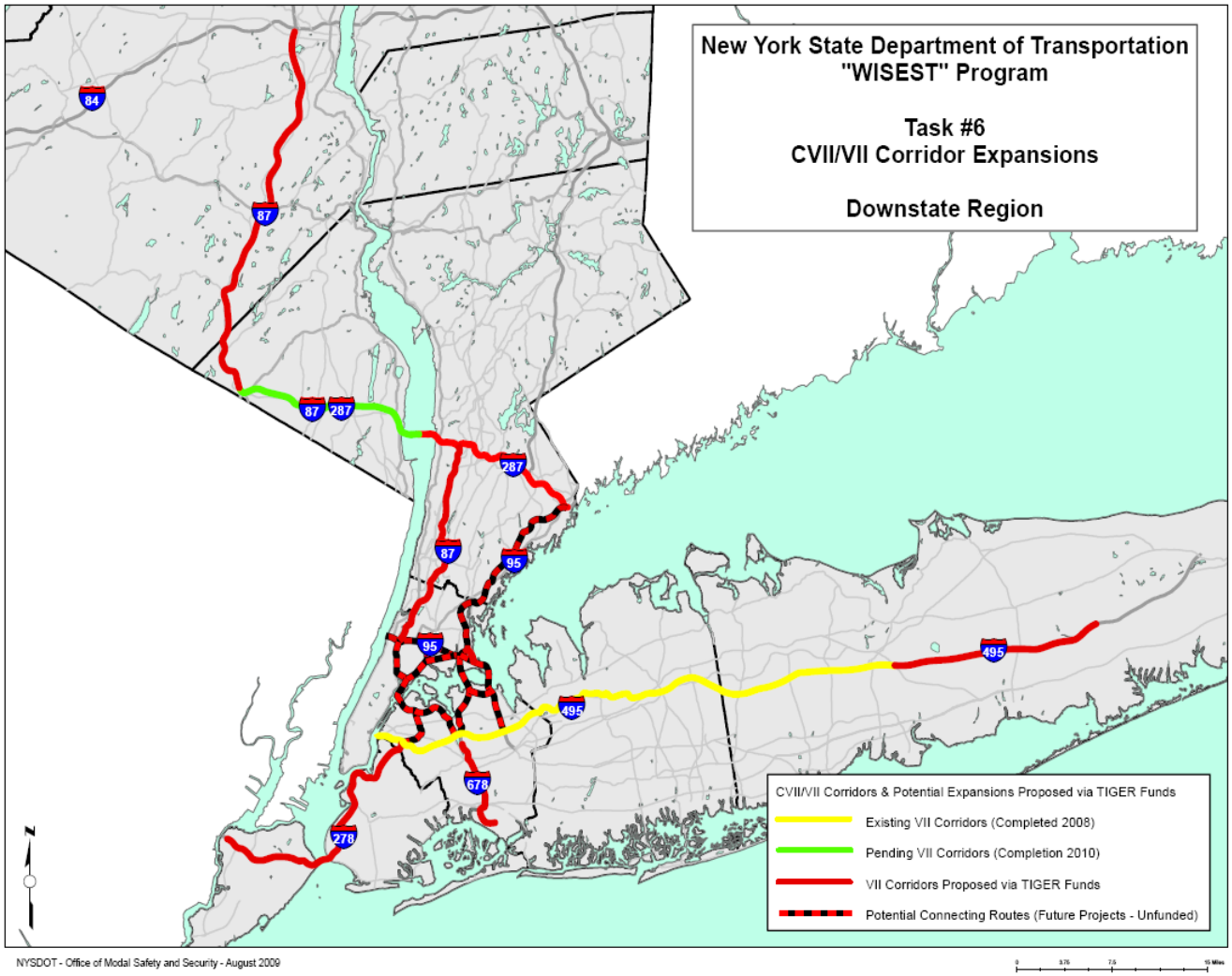
CVII Phase 2:
3. Enhanced Active Safety (Safe to Merge)

- The passenger car is overtaking the CV
- The CV includes weight and/or stopping distance in its heartbeat and we display a message to the driver of the pass-car when it is ok to merge in front of the CV.
- HMI could be shown as a Red-Yellow-Green zone

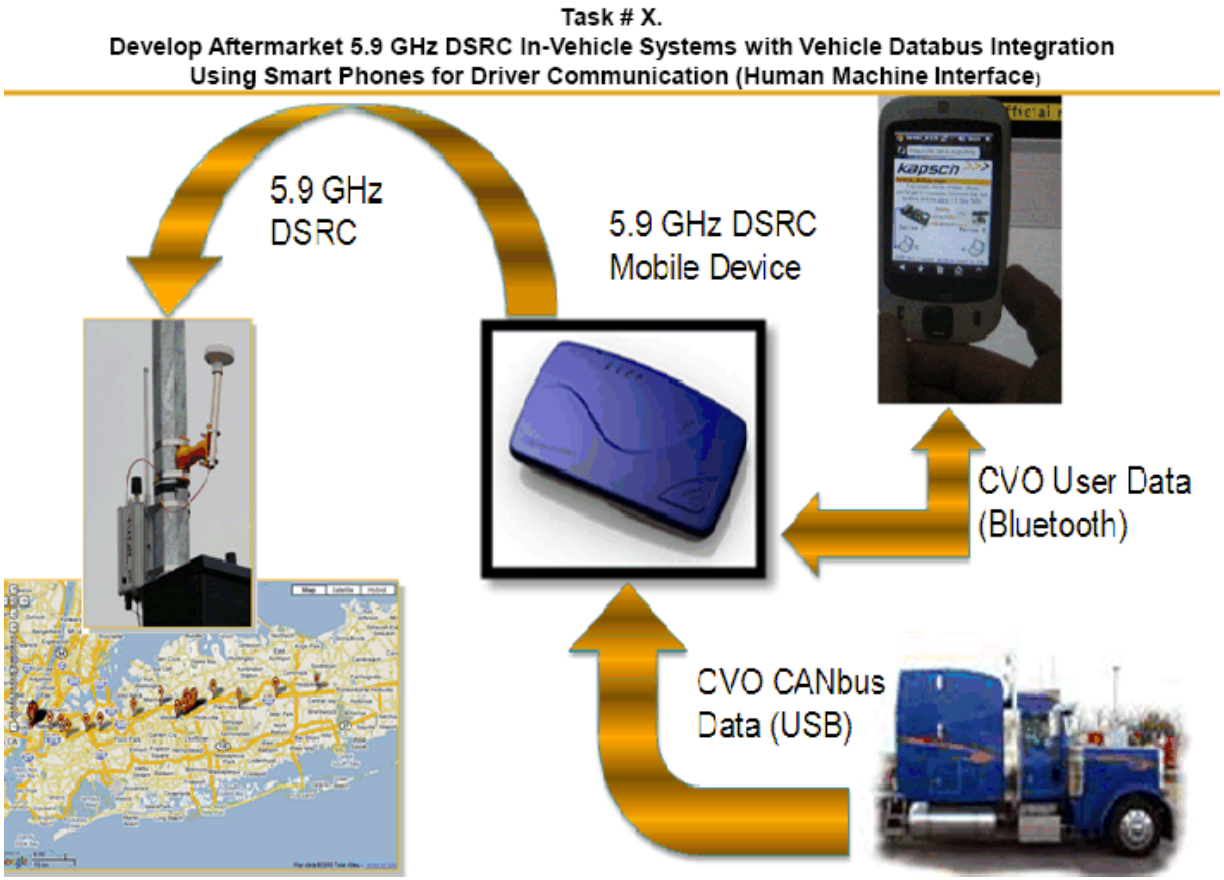
NYSDOT Long Island Expressway IntelliDrive Test Bed



NYS IntelliDrive/CVII Corridors



Kapsch/NYSDOT/NYSERDA Commercialization of Aftermarket 5.9 GHz Device



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IntelliDrive Commercial Vehicle Working Group

Alrik L. Svenson
Research Engineer
NHTSA

IntelliDrive Commercial Vehicle Working Group

- The U.S. DOT invites interested stakeholders in the commercial vehicle industry to work with the Department on IntelliDrive in the areas of:
  - Safety
  - Mobility
  - Environment
- Opportunity to contribute to the research, development, and implementation of IntelliDrive
- Separate subgroups are being formed for each of these research areas

Commercial Vehicle IntelliDrive Workshop

- Held in conjunction with the April 2010 CVSA Spring Workshop in San Antonio, TX
- U.S. DOT CV IntelliDrive Workshop: April 21, 2010
- Meeting information will be posted at www.cvsa.org
- Presentations on current commercial vehicle Intellidrive plans and projects
- First CV Working Group meeting

CV IntelliDrive Workshop Information

For more information on the commercial vehicle working group or the April Workshop contact:

- Alrik Svenson, NHTSA, Alrik.Svenson@dot.gov
- Jon Mueller, FMCSA, Jon.Mueller@dot.gov

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